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The Role of Group Dynamics in Mixed Methods Health Sciences Research Teams

Leslie A. Curry[1], Alicia O'Cathain[2], Vicki L. Plano Clark[3], Rosalie Aroni[4], Michael Fetters[5], and David Berg[1]

Abstract

This article explores the group dynamics of mixed methods health sciences research teams. The authors conceptualize mixed methods research teams as "representational groups," in which members bring both their organizational and professional groups (e.g., organizational affiliations, methodological expertise) and their identity groups, such as gender or race, to the work of research. Although diversity and complementarity are intrinsic to mixed methods teams, these qualities also present particular challenges. Such challenges include (a) dealing with differences, (b) trusting the "other," (c) creating a meaningful group, (d) handling essential conflicts and tensions, and (e) enacting effective leadership roles. The authors describe these challenges and, drawing from intergroup relations theory, propose guiding principles that may be useful to mixed methods health sciences research teams.

Keywords

mixed methods research, health sciences research, teamwork, group dynamics

Mixed methods research teams, namely, groups of researchers using both qualitative and quantitative approaches in a single study or in phases within a long-term study, have been recognized as valuable for nearly two decades (O'Cathain, Murphy, & Nicholl, 2008) and are becoming increasingly common, particularly in the health sciences (O'Cathain, 2009; Plano Clark, 2005, 2010). Although mixed methods teams may be able to yield unique and more comprehensive insights about a topic than those using a single method alone, the significant and necessary diversity in such teams presents multiple challenges. Despite the potential contributions of mixed methods teams, and their increasing prevalence, little is known about the nature and sources of these challenges, or how they can be effectively managed.

Literature on interdisciplinary teams can be relevant for understanding mixed methods health sciences research teams. Interdisciplinary health sciences research requires spanning strong

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disciplinary boundaries within academic institutions, particularly between the natural and social sciences, and managing the tensions inherent in crossing these boundaries (Aagaard-Hansen & Ouma, 2002; Aboelela et al., 2007; Giacomini, 2004; Nair, Dolovich, Brazil, & Raina, 2008). Teams often comprise members with diverse professional backgrounds, such as sociology, psychology, statistics, economics, nursing, public health, and medicine. This diversity can give rise to philosophical discordance, such as in epistemological views, and practical challenges, such as managing power differentials and roles within the team and the lack of shared language.

Less is known about the particular dynamics in mixed methods teams. Evidence suggests the methodologic diversity poses challenges for establishing meaningful collaboration and integration of the employed methods (Bryman, 2006; Plano Clark, 2005). Models characterizing mixed methods teams have been described, including the "distanced," "related," and "integrated" model (Shulha & Wilson, 2003). This typology classifies teams on a continuum according to their motivation for involvement, depth of participation, quality of dialogue, authority for decision making, and meaning making. A second model distinguishes among "interdisciplinary," "multidisciplinary," and "dysfunctional" teams in which team members work collaboratively, separately or in conflict (O'Cathain et al., 2008). These models reflect the nature of collaboration and degree of methodological integration within teams, suggesting some are more functional than others. Impediments to successful mixed methods teamwork include status differentials associated with perceived superiority of particular methodologies (Brannen, 1992), inadequate expertise in mixed methods, ineffective communication because of a lack of shared language or "methodological disrespect," and limited valuing of interdisciplinary approaches (O'Cathain et al., 2008).

To our knowledge, no prior literature has applied a theoretical framework to provide deeper insights into the nature of dynamics and tensions in mixed methods research teams or suggested guiding principles or strategies for effectively managing such tensions. In this article, we seek to address these gaps. First, we characterize our collective experiences in mixed methods teams in the health sciences, using theory on intergroup relations to understand these experiences. Second, we propose guiding principles and strategies that may be useful to mixed methods teams as they navigate the tensions inherent in this work. These suggested principles and strategies are based on our collective professional experiences and concepts in representational group theory and interdisciplinary teamwork.

The article is organized in five sections. First, we briefly describe our team to provide readers with a context for interpreting our professional experiences. Second, we outline our approach to investigating this topic. Third, we present an overview of representational group theory as a framework for understanding these experiences. Fourth, we describe five challenges, provide illustrative examples, and propose guiding principles for the ongoing management of each. We close by summarizing key insights and potential implications of this work.

Who We Are

Our team brings substantial experience and a diverse set of perspectives to understanding working in mixed methods teams in health research. We have 99 cumulative years of professional experience in conducting mixed methods health sciences research. As a group, we are diverse with regard to a number of professional and personal qualities, including methodological training, academic discipline, duration and nature of experience on mixed methods research teams, gender, age, country of residence, and religious affiliation. Although some of us have primary preparation in a single research method (qualitative or quantitative), others have had either formal training or extensive practical experience in designing and conducting mixed methods research. Our professional disciplines include health services/health policy, clinical medicine, organizational psychology/group dynamics, education, physics, and sociology. Although we all work in academia, we are based in diverse university departments including medicine, nursing, public

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health, health and related research, and educational psychology. Our research has primarily addressed topics broadly related to health and health care, with one team member (VPC) focusing primarily in the field of education but having worked on teams from primary care and nursing. We also represent diverse cultural contexts including multiple regions of the United States as well as the United Kingdom and Australia.

Approach

This article is the product of an 18-month process of dialogue and exploration among our team members regarding our experiences in working in mixed methods health sciences research teams. Our initial discussions took place at the 2009 International Conference on Mixed Methods in Harrogate, U.K., in which we (LC, AOC, VPC, MF) discovered commonalities in terms of the challenges and rewards of such work. We found that the nuanced and complex nature of these challenges had not been well described in the literature, nor was there guidance regarding how to potentially manage such challenges. Consequently, we sought to develop a thematic representation of dynamics and tensions inherent to working in mixed methods health sciences research teams. We reached out to two colleagues who would bring diverse perspectives and backgrounds to our discussions (RA, DB) and who shared an interest in contributing to the literature on this topic. Based on this experiential and theoretical input, we explored mixed methods health sciences research teams using an established theoretical framework from organizational psychology. Our work has taken place in multiple venues and forms, including in-person meetings, international conference calls, e-mail correspondence, and various independent writing and reflection exercises. We presented an early version of this work at the International Conference on Mixed Methods in Baltimore, Maryland, in 2010, and gathered substantive input and feedback from colleagues at the conference that informed our thinking.

We synthesized our individual and collective reflections regarding our professional experiences to identify common challenges associated with teams conducting mixed methods research. These challenges include (a) dealing with differences, (b) trusting the "other," (c) creating a meaningful group, (d) handling essential conflicts and tensions, and (e) enacting effective leadership roles within the team. These challenges are not mutually exclusive; in fact, they intersect in important ways. For instance, trusting the other requires commitment to working through essential conflicts and tensions, and success in navigating these conflicts is largely determined by the quality and degree of trust among team members.

In seeking to understand these experiences and to propose potential strategies for addressing them, we then turned to relevant empirical literature regarding interdisciplinary and mixed methods teams as well as literature on representational group theory. We found representational group theory to provide a particularly useful framework for conceptualizing the challenges we had experienced and suggesting potential strategies for mitigating these challenges. In some instances, the principles we propose are derived from representational group theory, whereas others are grounded in our collective professional experiences, empirical literature, or a combination of these.

Representational Group Theory

We use the term *representational group theory* to describe a set of concepts derived from the study of intergroup relations, based in organizational psychology. Representational group theory posits that all groups are composed of "representatives" (Berg, 1979; Rice, 1969; Wells, 1995). When we work on teams, we participate *both* as individuals and as members of a variety of groups. As individuals, our personality characteristics (e.g., assertive, reserved, critical) affect

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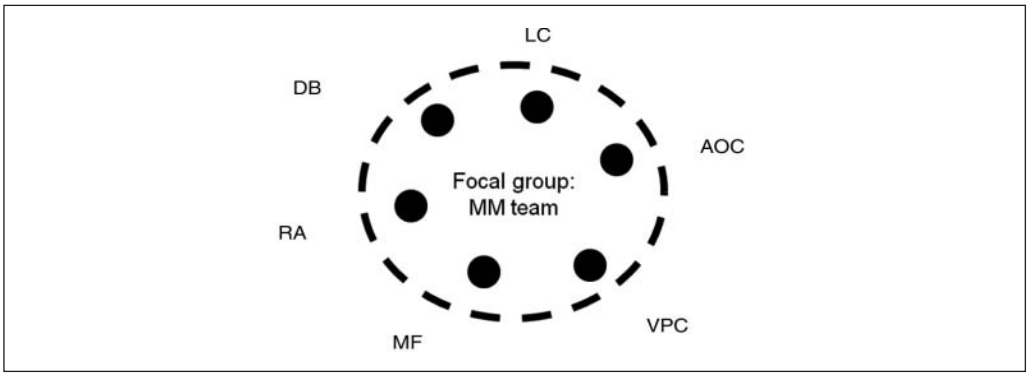

Figure 1. *Individual-interpersonal* view of a mixed methods health sciences research team

both the way we behave in groups and the way others respond to us through interpersonal interactions. However, what is less often appreciated is the fact that we also bring our multiple organizational, professional, and identity group memberships (e.g., professional or functional training and experience, religious affiliation, gender, race) with us to the team.

When teams are seen as groups of representatives, a number of important features of the dynamics among these groups come into focus. First, the current and historical relationships among the groups represented on the team play an important role in the relationships among the individual team members (Alderfer, 1987; Alderfer & Smith, 1982). The interpersonal relationships on the team cannot be divorced from the relationships between and among the groups represented in the team. Second, relationships among groups include the potential for restricted and distorted communication (Sherif & Sherif, 1969). What is discussed and understood within groups is different from what is discussed and understood between groups (Blake, Shepard, & Mouton, 1964). Third, groups tend toward ethnocentric views of themselves and the groups around them, views that emphasize their own positive characteristics and the negative characteristics of other groups (LeVine & Campbell, 1972). Inevitably, representatives bring some of these views with them to the teams on which they work. Finally, the combination of historical relationships, restricted communication, and a tendency toward ethnocentric views leads representatives to treat each other with some suspicion and mistrust (Deutsch, 1973).

We present three figures to highlight three related yet distinct dimensions of intergroup relations. These are sequenced in terms of complexity, beginning with the individual-interpersonal dimension, moving to recognize individuals as belonging to multiple home groups, and ending with the fully developed view illustrating the relationships among these multiple home groups.

In Figure 1, we represent an *individual-interpersonal* view of a mixed methods research team. In this view the major dynamics on the team are interpersonal, occurring between the individuals on the team (the black dots inside the dotted line). Style, personality, skill set, team player are all terms associated with this view and point to the types of issues that need to be managed when working with this conception of a mixed methods team. This is an important and accurate view of mixed methods teams. However, we argue that this view alone is limited in its ability to help us understand and work with such teams.

Figure 2 illustrates how home groups are not accounted for adequately in the individual-interpersonal view. This figure deemphasizes the individual (the names lighten in tone) and uses VPC to illustrate the fact that each individual belongs to multiple types of home groups (e.g., methods expertise, organizational affiliation, identity, discipline, status/level of authority). We call these "home groups" because they are the representational groups from which each individual

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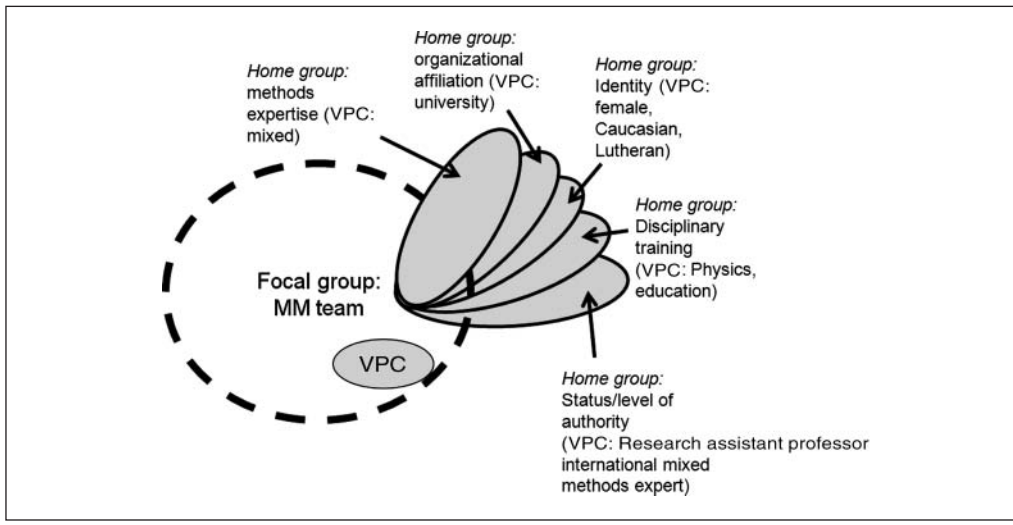

Figure 2. Deemphasizing the individual and highlighting the home groups represented by that individual

comes to join a mixed methods health sciences team. Each of the members of the mixed methods research team (e.g., LC, AOC, VPC, MF, RA, DB) belongs to multiple home groups and brings expertise, perspective, and focus from these home groups to their participation on the project. In the language of representational group theory, Figure 2 brings into focus the reality that individuals are also group representatives.

Figure 3 is a *group-intergroup* view of a mixed methods health sciences research team derived from representational group theory. In this view, the representational dynamics are highlighted. The black arrows represent the relationship between the individuals and their home groups: how strongly they identify with this group, how important membership in this group is, what they have learned from this group about research and health sciences, what norms are appropriate for professional collaboration, and what images they carry with them about members of other groups. The white arrows represent the current and historical relationships between the various home groups: quantitative and qualitative researchers, physicians and social workers, academics and practitioners. Stereotypes, interdisciplinary collaboration, institutional baggage are terms associated with this view and also point to the types of issues that need to be managed when working with this conception of a mixed methods team. These two views (Figures 1 and 3) are not mutually exclusive. Any mixed methods team can be viewed in both ways. Because we seek to offer a novel way of thinking about an underappreciated aspect of team dynamics, in this article we focus our lenses on the group-intergroup view, examining the issues that arise in striving to manage these teams effectively and suggesting guidelines and strategies for addressing them.

The dynamics in the group-intergroup conceptualization of a mixed methods health team are complex. We become representatives of these groups in both explicit and implicit ways. Often, in mixed methods teams, we are explicitly recruited to the team because of expertise in a particular research methodology, for example, as "the qualitative researcher" or, less frequently, "the mixed methods expert." Nevertheless, team members may implicitly view us as representatives of other groups, such as women, physicians, or sociologists, regardless of whether we have been formally assigned this particular role. Even when we are brought to the team for our particular expertise (e.g., qualitative methods), that expertise may be foreign to the team and therefore challenged by other members.

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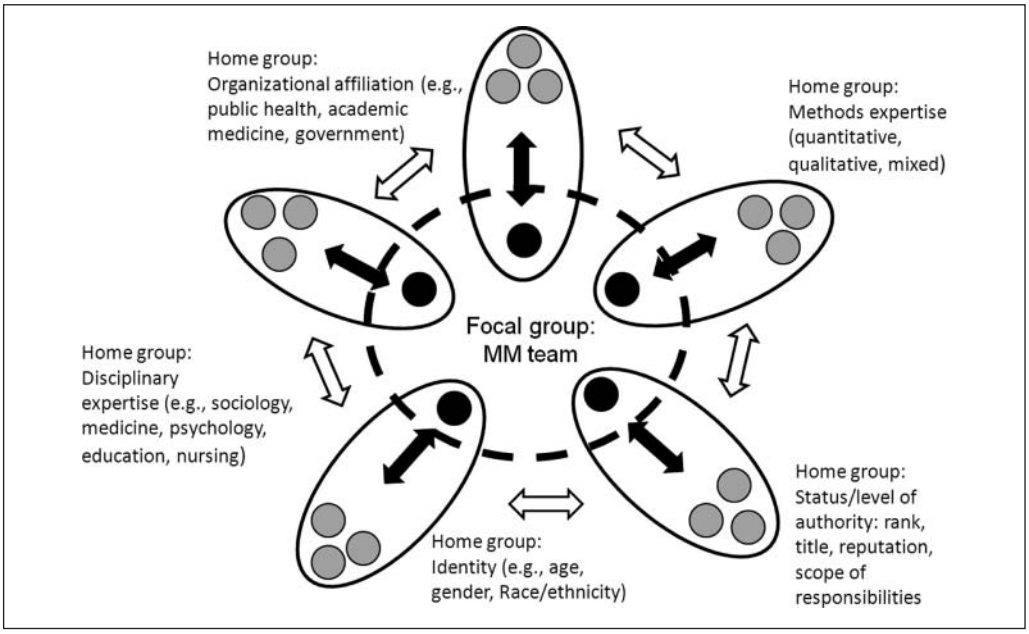

Figure 3. *Group-intergroup* view of a mixed methods health sciences research team

We also assume another critical role when we join a mixed methods project, that is, as a member of the mixed methods research team. From the first moment the team begins work, group dynamics are set into play. Some of these dynamics involve *interpersonal* histories, such as past experiences, positive and negative, between individuals (for guidance on managing interpersonal dynamics in teams, see Kahn, 2005; Schein, 1969). But much of what affects the functioning of mixed methods teams is rooted in *intergroup* histories (past experiences between professional, organizational, and identity groups). For example, in health research, the relationship between physicians and nurses may be particularly relevant. These histories influence the way team members hear and interpret each other's words (e.g., suggestions, criticisms), react to each other's behavior (e.g., level of participation, attendance), and feel about the relationships on the team (e.g., annoyed, appreciative). Likewise, histories between methodological "camps" can also influence teams. For instance, whether the qualitative expert on the team is involved in the overall research design or only the qualitative data collection, or whether the quantitative expert collaborates with the qualitative expert to draft an integrated results section of a manuscript, may be less about their individual roles and more about the relationship between qualitative and quantitative group perspectives on the team. These role definitions are also shaped by the historical values and use of methods embedded in each member's academic discipline, organization, or profession, such as physician or nurse. Accordingly, the relationships between the groups on the team (their relative status on the project, their historical relations in this research area or institution), may be the major factor in how individual roles are assigned (both explicitly and implicitly) in the team.

Challenges and Principles

The challenges we have observed in our experiences with mixed methods health sciences teams align with many of the issues that are highlighted by taking a representational group perspective of these teams. These five challenges we identified are described below, together with suggested

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Table 1. Challenges and Suggested Guiding Principles for Addressing Them in Health Sciences Mixed Methods Based on Representational Group Theory

Challenges	Suggested Guiding Principle for Addressing the Challenge
Dealing with differences	• Let people have their groups • Foster and sustain respect among team members
Trusting the other	• Make all group memberships discussable without penalty • Encourage and support candor
Creating a meaningful group	• Establish a minimum shared commitment to the project's overall goal • *Enable team members to speak freely* without fear of blame, criticism, or rebuke • Support members in sharing mixed methods team views with their home groups • Develop a common language • Ensure time and processes to enable information exchange • Articulate roles, responsibilities, and processes • create a safe space
Handling conflict and tension	• Normalize the essential tensions • Recognize the temptation to withdraw • Establish mechanisms for conflict resolution
Enacting effective leadership roles within the team	• Treat leadership as a role rather than an individual characteristic • Balance issues of relationship and task

principles and strategies to guide the ongoing, iterative process of managing each. A summary is provided in Table 1.

Dealing With Differences

When researchers expect and embrace differences, diversity can bring both excitement and new ways of thinking to our work. Yet we typically tend to avoid differences, address them only superficially, or silently wish they did not exist. Mixed methods team members may represent home groups that have profoundly distinct epistemological orientations and beliefs about the role of various research methods. Consistent with experiences in qualitative research teams, mixed methods team members may have philosophical differences (Barbour, 1998; Richards, 1999; Sandelowski, 2000), different world views about the topic under consideration (Barry, Britten, Barber, Bradley, & Stevenson, 1999), or different values about aspects of the research such as academic dissemination, including authorship and manuscript form (Massey et al., 2006). These differences may be underscored by members' organizational contexts, including norms and expectations for disseminating research in particular forums or using particular methods. For example, one team member may experience feelings of alienation when working with another methodologist who believes he or she has the only valid way to understand a phenomenon or that only positivist methods contribute to theory creation and validation. In health research, a quantitative researcher may value probabilistic sampling and large sample sizes and judge the utility and quality of the qualitative research as poor because it does not align with his values. Repeated questioning of the sampling and sample size of the qualitative research by some team members may lead to the qualitative researcher feeling demoralized as she defends her methodology rather than engage with the team about the meaning of their findings for the study as a whole. This may lead to compromises over sample sizes, with a qualitative researcher agreeing to interview

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large numbers that prove to be unmanageable to recruit, interview, and analyze in depth within the study timetable. Or this disagreement can become identified with the personal qualities of the researchers rather than their group representation, with individuals blaming others for their unclear communication, aggressive behavior, or irrational thought processes.

Guiding principles for dealing with differences. Several guiding principles can be useful to teams struggling to manage differences among members. These principles are based on the observation that group memberships are always represented on mixed methods teams. These memberships cannot and should not be ignored or minimized. First, representational group theory guides us to *let people have their groups* (Berg, 2005). Often in research teams there is pressure to speak from a broad perspective rather than from the narrow perspective of one's professional background. Yet one of the primary reasons that different types of researchers are on mixed methods teams is in order to represent their particular experience. If each member of the team speaks from their professional perspective first and explicitly, these diverse perspectives are available for discussion and debate. This sharing also allows members of the team to refer back to the group interests being represented when a decision is being considered. This not only emphasizes that the opinion comes from a particular area of expertise but also that the area of expertise, like all areas of expertise, has its limitations and needs reactions from other areas. An emphasis on having people speak from their own perspective is paradoxical since this individuality must be allowed to flourish in order for the team to maximize its potential. For example, one of us is working with a health research team that has used quantitative methods exclusively, but has decided that their randomized controlled trial (RCT) requires a qualitative component. To accommodate the integration of this method, team members (unfamiliar with mixed methods) sought to make inappropriate alterations to the RCT treatment conditions to incorporate the unfamiliar method. By moving too quickly into qualitative territory, the researchers started to set aside their quantitative "home group," thereby threatening the integrity of the overall project.

Second, *foster and sustain respect among team members*. It is often the case that the historical relationships between groups leaves a legacy that includes a lack of respect (Alderfer, 1977). Striving to respect others' methodological expertise, philosophical stance, worldviews, and the expectations others face from their external contexts (academic institution, professional organization) is a necessary but often difficult requirement for effective teamwork. Such respect enables effective information sharing, since it allows members to feel safe in voicing concerns and in speaking candidly. Respect is demonstrated by seeking to understand the other through asking questions, debating, and engaging. Respect may be undermined in multiple ways. Individuals who do not value the expertise or input of others may acquiesce, act paternalistically, or act relatively uninterested in their ideas or suggestions. For instance, a qualitative methodologist on a mixed methods team may solicit suggestions from team members on a discussion guide for in-depth interviews, yet dismiss the concerns of the statistician about its reliability. Individuals who disrespect other team members may exert control (subtly or not so subtly) or challenge them. In this same example, the statistician might aggressively challenge the qualitative methodologist, expressing skepticism about the utility of qualitative data and advocate strongly for a standardized data collection instrument. If the statistician has greater credibility among team members, her opinion can provoke others to disrespect, or devalue, the expertise of the qualitative researcher. In either of these instances, the project would benefit from open acknowledgement of each member's bias or assumptions about the other, since this dynamic cannot be managed unless it is made explicit in the group.

Trusting the "Other"

Another legacy of historical intergroup relations can be a significant lack of trust. Although trust is a central issue in all work environments (Alderfer, 1977; Shaw, 1997), in mixed methods

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teams, trust reflects the confidence members have in each other not to exploit each other's vulnerabilities (e.g., knowledge gaps, idiosyncrasies). From the perspective that views mixed methods teams as representational groups, trust can refer to the shared understanding that the different "groups" represented on the team will "fight fair" when inevitable conflicts arise over design, data collection, analysis, and writing. A "fair" fight is one that occurs in the open with all relevant thoughts and feelings, positive and negative, expressed (Alderfer, 1976; Rogers, 1961). Fights that erode trust among representatives are those that are avoided, handled "off line," or never get finished and lead to unilateral action (by one team member or a subgroup of the team) or withdrawal by one or more group members. For example, one of us joined a mixed methods team and was uncertain how potential manuscripts were proposed for consideration by the group. When the member suggested a somewhat controversial manuscript, the team reacted negatively, believing that the manuscript could undermine the overall methodology. In this instance, the member felt it was important to respect the concerns of those involved in order to maintain respect and earn their trust.

Guiding principles for trusting the "other." Two guiding principles can facilitate building trust among team members. First, *make all group memberships discussable without penalty* (Berg, 2005). The paradox of trust is that when team members feel comfortable sharing the perspectives and concerns of their home groups, the dynamics associated with feelings of threat and ethnocentrism (the belief that one's own group has primarily positive attributes and that other groups have primarily negative ones) can often be softened. But this comfort comes only when the members of the mixed method teams create a history of discussing their home groups, both at the inception of the project as well as throughout the course of work. Second, *encourage and support candor* among team members, including the simultaneous assertion of competence and limitations (Alderfer, 1977). This makes it possible to balance the role of representative (bringing competence to the work) with the role of mixed methods team member (bringing a limitation that requires the input of others).

Creating a Meaningful Group

The mixed methods team, to be successful, must be experienced by the members as a serious group membership, almost as serious a membership as their home group(s) (Alderfer, 2011). If members cannot identify (i.e., make part of their identity) with the mixed methods team, they will persist in only representing their home groups and have difficulty feeling and acting on their mixed methods team membership. Meaningful teams must develop a common language and be able to approach the work from a mixed methods perspective rather than a collection of individual quantitative or qualitative or disciplinary perspectives. For example, individuals trained in different content areas (e.g., nursing and education) do not always share terminology (e.g., medical terms, drugs, learning approaches), which can hinder communication and interpretation. In addition, individuals trained in different methods areas may have trouble differentiating important terms from jargon, such as purposeful sampling (isn't there a purpose to all sampling?) and themes (isn't that a term from music composition?).

Guiding principles for creating a meaningful group. Several guiding principles can be valuable in this regard. First, *a minimum shared commitment to the project's overall content goal is a prerequisite for creating a meaningful group.* Team members must have a common goal for the project and *some* appreciation for the potential contribution of the others on the team. This shared vision is needed to realize the benefits of collaborating across groups and to hold the team (the "focal group") together through the tensions and challenges that arise (Deutsch, 1973; Sherif & Sherif, 1969). Second, create a safe space for members to voice the views of their groups to the mixed methods team. An environment that allows team members to speak freely without fear of

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blame, criticism, or rebuke has been referred to as "psychologically safe" (Edmondson, 1999). This requires managing the tension between maintaining the integrity of the boundaries around the group each member represents and around the mixed methods team as a whole while opening these boundaries up to allow the give and take across the groups. Maintaining the integrity of the boundaries allows each group to control its own quality standards. Yet opening these same boundaries to the experience and expertise of other groups is what makes true collaboration possible. Third, *support members in sharing mixed methods team views with their home groups.* The representational dynamics of mixed methods teams work in two directions (recall double-headed black arrows in Figure 3). Not only does the team member represent her home group's expertise to the mixed methods team, she also represents the mixed methods team to her home group(s). If the home group (e.g., quantitative researchers) remains fixed in its narrow view of the other (e.g., qualitative researchers), then the quantitative members of the mixed methods team are more likely to remain fixed and narrow in their relationship to the qualitative members. Joint methodology papers in each other's respective professional groups or joint colloquia in each other's departments are examples of ways that team members can influence each of the team members' home groups. Fourth, *develop a common language* that can support team members in adopting a mixed methods perspective. This can be facilitated when team members have "methodological bilingualism," or a minimum competency in both methodologies to enable communication and integration of findings (Tashakkori & Teddlie, 2003). This may be limited by the fact that the number of individuals trained in mixed methods is relatively small, and we still have individuals doing the teaching who are trained predominantly in either qualitative or quantitative methods and who do not always share a full mixed methods view. One strategy is to develop a team glossary that provides collective understandings of key content and methodological terms. Another is to include individuals with formal transdisciplinary training on the team. Such individuals have a working knowledge of different theories and methodologic tools and are deliberately integrative in their disciplinary approach to research (Nash, 2008). There are many advantages of having such individuals on a team, including their ability to establish linkages between the health and social sciences (Rosenfeld, 1992) and to encourage systems thinking central to public health (Leischow et al., 2008). Particularly valuable for developing a common language is the ability to serve a mediator or broker function, through speaking a "hybrid" language that reflects and synthesizes the core terminology from different disciplines. Fifth, *articulate roles, responsibilities, and processes.* Formal and explicit delineation of roles and responsibilities in a formal document may be useful to the establishment and ongoing management of the team. Such a document, although a potentially valuable tool, will not fully preclude challenges from arising. Finally, *ensure time and processes to enable information exchange*. Although virtual communication may be acceptable, there often needs to be face-to-face or teleconference at the very least given the potential (Smith and Berg, 1987) for miscommunication of strength of comment or emotional intent by e-mail. This also includes creation of shared space for project documents, data, meeting notes, research protocols, and use of software that permits the mixing of data. In an international mixed methods project conducted by one of us, weekly conference calls were critical for developing a mutual understanding of the project direction. As the analytic team was based in one country, and the qualitative analytic procedures were unfamiliar to the researchers in the collaborating country, we ultimately placed all analytical documents as they were evolving on a server that could be accessed by anyone on the team, and two members of the team from the collaborating country were invited to make a site visit to learn more about the procedures. As a consequence of their visit, they were able to better explain to the remaining team members the complexity of the approach, and the differences in output between qualitative software, which was unfamiliar, and from statistical software, which was familiar.

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Handling Conflict and Tension

Tensions naturally spring from the extreme diversity among members of mixed methods teams, as well as the potentially conflicting norms and expectations from team members' organizational and professional "homes." The cognitive distortion and ethnocentrism described above (LeVine & Campbell, 1972) may be a particular issue in mixed methods teams, where the undervaluing of other perspectives can be deeply ingrained by methodological "camps." Fragmentation within the team (alliances among members who have the same stance on the issue underlying the tension) and ineffective or incomplete information sharing (constrained by awkward or unpleasant interpersonal interactions) are also sources of conflict and tension. Tensions may also develop over methodological decisions, such as using a representative or purposive sample, clinical perspectives, such as viewing the issue from a physician, nurse, or social worker perspective, or procedural decisions, such as the ordering of authors on manuscripts and selecting target publication outlets.

Guiding principles for handling conflict and tensions. Three guiding principles can be valuable in handling conflict and tensions. First, *normalize the essential tensions*. Accepting discord as a natural and expected consequence of working in highly diverse groups is an important operational premise (and one underscored by representational group theory; Blake et al., 1964; Deutsch, 1973). This can be facilitated by regular public acknowledgement that working through these tensions is essential for any mixed methods team to be successful. Teams that fail to recognize the tensions inherent in diversity may experience pathological manifestations such as passive aggressiveness and fragmentation that affect the quality of the work. Second, *recognize the temptation to withdraw* from the team in the face of these tensions and take steps to help members remain engaged with each other. This is easier said than done since conflict can drive some team members out of the team either physically or psychologically. As we discuss below, one of the responsibilities of the leadership role in mixed methods teams is to ensure that the team embraces rather than avoids any tensions that may be impeding its ability to function optimally. In its simplest form, this means those in the leadership role need to be able to place on the team's agenda a discussion of emerging conflicts and tensions. Last, it is important to *establish mechanisms for conflict resolution* as part of internal research management process (Blake et al., 1964; Deutsh, 1973). This may include negotiating management of changes from original grant plans (e.g., when proposed methods are found not to be working, or not appropriate, and new changes/procedures may be required) and working through the difficult decisions associated with many mixed methods studies around issues such as sampling.

Enacting Effective Leadership Roles Within the Team

Leadership has been identified as central to the success of research teams (Aagaard-Hansen & Ouma, 2002), including mixed methods teams (O'Cathain et al., 2008). Representational group theory suggests that leadership requires constant attention to the relationships among groups. These relationships can create tension because home group affiliations are very deep, where one may have trained for decades as a qualitative researcher, or a statistician, or a cardiologist, or a nurse; this training inculcates a deeply embedded view of others. Although these deep-seated views may pose challenges, these strong affiliations and resulting expertise are precisely the assets each member brings to the mixed methods team and are essential for the success of the effort. Team leadership that values integration of qualitative and quantitative study components can mitigate these challenges and potentially improve the quality of research outputs (O'Cathain et al., 2008). One model of leadership in mixed methods teams, "individual participatory leadership" (Galt, 2009), suggests that fluidity in roles is central in such teams, where individuals

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take action or lead the team at different points during a project, depending on the project needs. For example, one mixed methods team included individuals with very strong affiliations to their individual method home groups. When the principal investigator was absent from a team meeting, great tensions and personal issues emerged from the team meeting, and these relational issues precluded the team from accomplishing its tasks.

Guiding principles for enacting meaningful leadership roles. Two principles can guide teams in efforts to enact meaningful leadership roles. First, *treat leadership as a role rather than an individual characteristic* (Berg, 1998). On a mixed methods research team, there are often representatives of different "authority" home groups (tenured or nontenured faculty, research assistants, administrators, professional identity groups). These authority home groups define power dynamics that may influence the interactions between team members. In health research, these dynamics are particularly acute between professional identity groups such as physicians and nurses. Although the nature of collaboration between these groups in research is improving (Houldin, Naylor, & Haller, 2004), differences persist. These dynamics are rooted deeply in ideological conflicts manifest in clinical settings (McMahan, Hoffman, & McGee, 1994) and related to hierarchy, particularly gender hierarchy that has historically characterized medical care (Campbell & Pollock, 1987). Sometimes leadership functions are performed by the person from the top authority home group in the team but not always or often. The project manager may perform some of these functions (e.g., scheduling time for and initiating reflections, coordinating meetings, minutes, and agendas, etc.). When viewed as a role, it is possible for the team to identify what functions it wants from this role throughout the project and which individuals could best provide these functions. To use the example from the preceding discussion of conflict and tension, the principal investigator may not be comfortable confronting the team with emerging conflicts that need to be addressed. If one thinks about leadership as a person, the team may feel stuck with an individual who is personally uncomfortable fulfilling this responsibility. The team (including the principal investigator) can choose an individual more comfortable or skilled in dealing with conflict to perform this function. Flexibility and resiliency are central to mixed methods teamwork, because of interdependency of multiple study components and the added complexity and potential for setbacks associated with this interdependency. Second, *balance issues of relationship and task* and events that disrupt balance. For teams to work effectively, leaders need to attend to not only task issues related to project goals but also relationship issues among team members. At times of conflict, the team leader may need to assume a strong leadership role and focus on relationship issues to keep conflict from getting out of control. The formal "work" of a mixed methods research team can drive out the time needed to "check in" on the way differences are being handled and addressed. The commitment to inquire about the team's process, both intergroup and interpersonal, must be regularly built into the agenda of team meetings, whether virtual or face-to-face.

Conclusion

In conclusion, we offer several key insights and explore the potential implications of this work. By illuminating the nature of the dynamics between individuals and groups on the team, representational group theory provides a useful framework for understanding the origins of the common challenges that arise in mixed methods teams and helps separate these challenges from the level of interpersonal conflicts. We sought to develop deeper insights into the nature of group dynamics and challenges in mixed methods research teams and to suggest principles to guide teams in navigating these challenges. We reflected extensively on our own professional experiences and informed our interpretation of these experiences through the relevant empirical literature and theory on representational groups. A central insight is that the diversity in mixed

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methods teams generates essential tensions that cannot be erased and in fact can be an asset. Although tension and conflict can feel very personal, representational group theory provides a framework for depersonalizing the tensions and instead placing the focus on differences among groups instead of differences between individual people.

Although we drew on our collective experiences in mixed methods health research teams, these insights may also be relevant to several other types of research teams, including interdisciplinary and mixed methods teams outside of health research and single methodology (quantitative or qualitative) research teams in which professional differences are extreme and knowledge of others' methodological or content expertise is poor.

The guiding principles we propose are consistent with strategies that have been proposed for fostering successful interdisciplinary teamwork. These strategies include a shared belief in the value of interdisciplinary approaches, adoption of "epistemological plurality" in which no single paradigm dominates the project, strong relationships among members, team leaders that value interdisciplinary work, and the creation of explicit role definitions (Massey et al., 2006; Milliman & Von Glinow, 1998; Nair et al., 2008; Robertson, Martin, & Singer, 2003). Yet there are several important qualifiers when applying these strategies in mixed methods. Although it can be important to preclude a single paradigm (such as constructivism or positivism) from dominating the team, it is possible the entire team might be working in the paradigm of pragmatism (Morgan, 2007), which some have advocated as optimal. Denscombe (2008) has proposed a research paradigm of "communities of practice," which is flexible and permeable to accommodate the diverse research practices characteristic of mixed methods and to allow for methods and approaches to be used for their particular practical utility in addressing a specific research question.

This article should be considered in light of a notable limitation. Although our suggested principles and strategies have empirical support in literature from organizational psychology studying groups and organizations, they have not been empirically tested in the context of mixed methods teamwork. However, they are grounded in our collective professional experiences and consistent with concepts in representational group theory and interdisciplinary teamwork. The development of interventions informed by this experience and extant literature, and the systematic assessment of their impact on team functioning and productivity, is an important area for future research.

We were struck by the similarities shared by combining individual researchers that represent different home groups in an effective mixed methods team with bringing diverse types of methods that represent different methodological traditions together to understand a research question. In both instances, we are attempting to integrate diverse perspectives into a whole that is greater than the sum of the individual parts. As such, many of the challenges and some of the strategies we have identified for working in teams correspond to challenges and strategies for combining research methods (see, e.g., Creswell, Plano Clark, & Garrett, 2008). For example, when integrating methods, researchers deal with differences in the methods and data, develop procedures that work effectively for each component, and face issues of convergence, divergence, conflict, and tensions in the results. Many of the guiding principles also have analogies in both realms (e.g., let methods meet their respective quality standards). However, teams also face emotional issues of trust and personal leadership, which go beyond the methodological challenges faced in mixing methods.

Mixed methods approaches, because they capitalize on the strengths of diverse scientific perspectives and professional expertise, can make unique and critical contributions to health sciences research. Yet this diversity, particularly when coupled with strong affiliation to various home groups with sometimes discordant historical relationships, presents complex dynamics and tensions among members of mixed methods teams. We propose that these group-intergroup dynamics require constant vigilance and explicit attention by each team member to exploit the value inherent in diversity and to facilitate the valuable process of conducting mixed methods research.

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